ANDREW SEYBOLD'S OUTLOOK

A Monthly Perspective of Issues Affecting the Mobile Computing and Communications Industries

Volume 18, Number 4/5
December 20, 1999

Below is The Outlook as we see it in our sugar plum dreams as we settle our brains for a long winter's nap, with Linda in her kerchief, and Andy in his cap.

OmniSky Debuts Services

OmniSky became the latest company to join the ranks of "wireless portal operators." The service provides access to the customer's own POP3 email as well as a number of useful information services (with more to come). OmniSky has addressed most of the aspects of its service correctly—especially with flat-rate pricing—even though its claims of "Fast Nationwide Service" are a bit of a stretch. While 3Com has been busy putting OmniSky in a position to be the most significant competitor to the 3Com Palm.Net service, other competitors have been making their moves. (A. Seybold, 4 pages)

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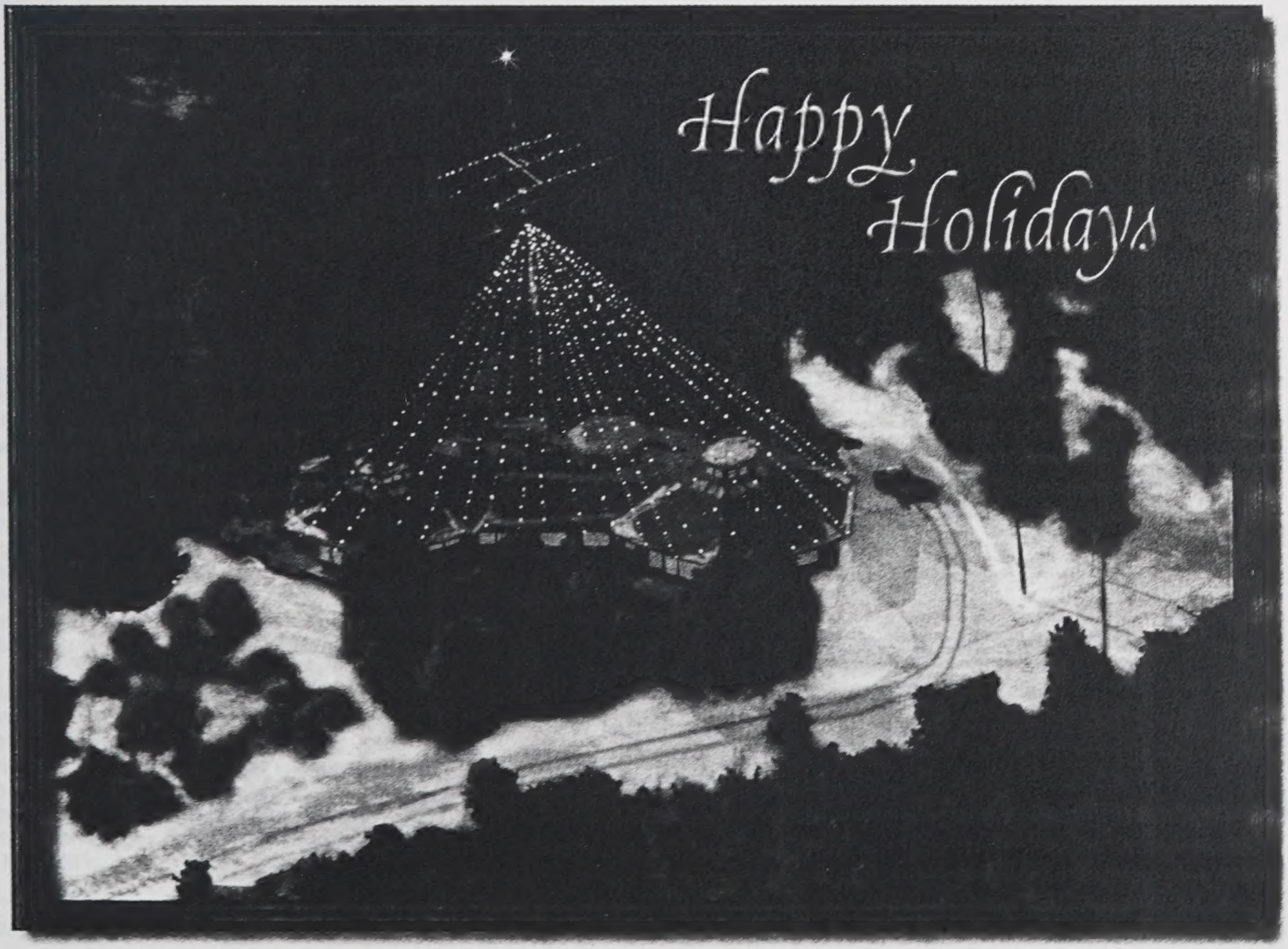

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Qualcomm's Preferred Wireless Data Technology Is Not 3G

Qualcomm celebrated its ten-year anniversary by demonstrating its latest technology, High Data Rate (HDR). HDR, which is based on standard Internet Protocol technology, is a data-only CDMA technology that supports data rates of up to 2.4 Mbps to the mobile device with a return rate of 153 Kbps. HDR requires a separate 1.25-MHz RF channel, and by simply adding an HDR channel card to an existing cell site, HDR is available. The combination of 1X and HDR appears to provide all of the technology capabilities and efficiencies of the ultimate 3G standards.
(B. Dewey, 4 pages) Page 7

Microsoft and Ericsson: A Match Made In Heaven?

Microsoft has an eye on the lucrative backend market as carriers plan to change their systems from computers that look and feel like switches to Internet Protocol-type backends where switches are replaced with routers. With this partnership with Ericsson, NT has a chance of finding its way into carriers' backend equipment. Meanwhile, others are making deals of their own.
(A. Seybold, 3 pages) Page 11

Wireless IT/Comdex/Bluetooth Developers

Products, services, technology refinements. With a year that ended with this much wireless activity, it is hard to imagine what 2000 will bring! (A. Seybold, 4 pages) Page 14

Letter To The Editor

Cees Links, General Manager, Lucent Technologies, provides a brief update on Bluetooth activity in response to questions posed by our editor-in-chief. (C. Links, 1 page) Page 18

Mobile Implementation

Chicago's Bank One Technology and Policy Have to Blend. Technology is but one half of the equation. The other is the broad business decision process within the corporation, where often there exist justifiable differences of opinion as to the right way to succeed. This is a story of a real-life illustration of one such situation. (V. Wortman, 4 pages) Page 19

Mobiltorial

Y2K and Merger Mania have been the buzz for 1999. Closer to home, The Outlook has had a great year and is especially excited about our new relationship with Forbes and the Summit 4Mobility in February. The Ninth Annual Wireless Dinner was the best yet with gifts, awards, and speakers. We look forward to next year being a great year for the wireless data industry, and express our wishes for you, our readers. (A. Seybold, 4 pages) Page 23

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OmniSky Debuts Services

by Andrew M. Seybold

At Comdex/Fall this November, OmniSky became the latest company to join the ranks of "wireless portal operators." Wireless Knowledge, Palm.Net, Phone.com, and GoAmerica are wireless portal operators as are companies such as Yahoo! with its Sprint PCS arrangement, and Research In Motion and Dell Computer with their BlackBerry products.

The purpose of a wireless portal is to provide wireless access to information. The type of information is determined by the portal operator's vision and varies from portal to portal. For example, Wireless Knowledge focuses on providing access to Microsoft Exchange-equipped corporations, Palm.Net currently focuses on individual users, and Sprint PCS wants to appeal to "Web surfers" who want to go wireless.

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What Is OmniSky?

OmniSky is a joint venture funded by 3Com and Aether Technologies. According to its Web site, "The innovative OmniSky service brings together the wireless Internet Services you want most in a single solution. Now, your Palm V provides convenient email communications and information you need, no matter where you are."

Other than the "no matter where you are" portion of this statement, the OmniSky model appears to have a lot of merit. Its first offering includes a Novatel CDPD (Cellular Digital Packet Data) modem with a great design that attaches to the Palm V. The modem makes the Palm V a little longer and about twice as thick, which is not a bad trade-off for wireless capabilities.

Obviously, the installed base of Palm V users is the target for this first offering. The services that come with the modem include Web Clipping *a lá* Palm.Net and a set of AvantGo channels. Services will be expanded, but at the moment these two are probably sufficient for many customers to find the OmniSky service useful.

Many applications have been enhanced for the OmniSky service. There are "Internet-savvy" versions of the Palm address book, date book, to-do list, and memo pad. Using industry-standard Vcard and Vcalendar functions, the OmniSky service enables its customers to exchange address and calendar information over the Internet as well as to capture OmniSky White and Yellow-page information directly into the address book.

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Email

OmniSky also provides the ability to send and receive email. Unlike Palm.Net, which requires customers to obtain a new and separate email or messaging address, OmniSky lets customers use their existing POP3 email account. ("POP3" stands for Post Office Protocol 3—the standard used by most Internet mail providers.) If you have an email account through an Internet Service Provider (ISP), you will be able to configure the OmniSky-equipped Palm V to send and receive email using your existing email account.

Once you have established OmniSky service and configured your wireless-enabled Palm V to send and receive email, as email messages arrive at your ISP, you will receive sender and header information on your Palm V. The modem light will flash to alert you that you have new email. You can instruct the system to send the email messages that you want to receive while you are away from your office to the Palm V where you can read them and respond. While you shouldn't expect to be able to view PowerPoint slides or other large attachments, you will be able to send and receive email messages. Your outgoing Palm V emails and replies will appear to the recipient to have been composed on your desktop using your regular email account.

The service provides access to the customer's own POP3 email as well as a number of useful information services (with more to come).

What OmniSky Did Right

Before we delve into the issues that we have with the presentation of its services, we will say that OmniSky has addressed most of the aspects of its service correctly.

OmniSky is rolling out its service in a limited fashion at first.

- The first offering is aimed at the large installed base of Palm V users.
- Start-up service includes the modem and service until the end of March 2000 for $299, which is a great price for the modem, let alone the service.
- The service provides access to the customer's own POP3 email as well as a number of useful information services (with more to come).
- The service is "nationwide" at a flat rate. Customers know exactly what it will cost each month.

This is a good start. The subscription offer is structured in such a way that the sooner you order, the more "free" airtime you have. There is no indication on the Web site of what the monthly service rate will be after the introductory period is over in March, but my bet is that it will be a flat-rate service in the high thirty to forty-dollar range. It is clear from discussions with the folks at OmniSky that they are committed, at least with this offering, to a flat-rate pricing plan.

In another smart move, OmniSky is rolling out its service in a limited fashion at first. This allows for time to gain experience with real-world customers and to work the bugs out. OmniSky has an exclusive arrangement with Novatel, the modem vendor, for some period of time and has made the wireless Palm V a hard-to-get and, therefore, sought-after product. (We are waiting for our modems to be shipped to us and will be providing a hands-on report in the near future.)

All in all, this is a great first offering from OmniSky and I suspect that it will be successful, meaning that 10% or so of Palm V users will sign up for the modem and service. It is a win for the CDPD network carriers—AT&T, Bell Atlantic, GTE, and Ameritech—that have been trying for several years to attract more customers to their networks with little success except in the vertical market spaces.

The Issues and Down Side

After having spent much of this article telling you how good we think this first offering is, we must also tell you that there are

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Wireless Service:
"Fast Nationwide Coverage at One Affordable Price"

"Fast" refers to a raw data rate of 19.2 Kbps and a delivered data speed of about 10 Kbps to the device (which is not very fast).

"Nationwide Coverage..."
Granted, AT&T has just turned on Los Angeles, but even with L.A. up and running, CDPD covers only about 60% of the U.S. business population. We give OmniSky credit for posting a map of claimed coverage on the site for reference. While it is clear that OmniSky is trying not to over-hype, it certainly is on the edge.

High-Speed Modem

We think that the modem is a nice design, and it does not make the Palm V too bulky. But no one familiar with the wired world would consider it to be fast, as is claimed on the Modem Web page as well as on the Wireless Service page. It would better serve OmniSky to claim a usable throughput of about 10 Kbps so as not to set the prospective customers' expectations too high.

OmniSky Has Set the Bar

It is clear to us that even with the exaggerated coverage claims, OmniSky, with its high visibility launch, has set the bar in several areas of the wireless portal business. First, it has reaffirmed that flat-rate packet-data pricing is the "correct" model by following in the footsteps of Research In Motion, American Mobile, GoAmerica, and Wynd Communications. Second, it is offering what might be considered an end-to-end set of solutions for a large installed base of Palm V users.

What is odd about this venture is that Palm (with the Palm VII and Palm.Net) is now competing with 3Com (OmniSky). It is difficult to understand why these two ventures were not joined at the hip. Or why they didn't at least share a common operations center or funding. Instead, 3Com, which will retain a major stake in Palm after spinning it off, has put OmniSky in a position to be the most significant competitor to Palm.Net service.

OmniSky executive staff members appear to "get it" when it comes to offering wireless data services. If they can execute on their commitments, OmniSky should be a successful venture. However, don't look for Palm.Net, BlackBerry folks, Saraide, Wireless Knowledge, and the other wireless portals to rest on their laurels. It would not be much of a stretch of the imagination to envision Palm.Net offering CDPD access to its backend using the Palm V once the exclusive for the modem has expired (early in 2000?), or to imagine Palm.Net and others adding to their existing offerings and going after corporations as well as individuals.

Research In Motion folks are not asleep at the wheel either. The BlackBerry client that resides in the RIM two-way messaging device already provides many of the features and functions found in Palm devices. BlackBerry synchronizes with the desktop calendar,

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phone book, to-do list, and memos. Every time it is returned to its cradle, it updates the device and the desktop, just as a Palm does. And for those who don't care for handwriting input, BlackBerry offers a small keyboard that is easier than it looks to use.

OmniSky puts the heat on the other wireless portals and wireless solution vendors.

Dell has agreed to market BlackBerry and several major ISPs are signing on. RCN has been placing full-page newspaper ads promoting BlackBerry in the San Jose area. Meanwhile, American Mobile has the same client on its RIM device and can offer access to POP3 email as well as all of the calendar and personal information management programs provided by BlackBerry.

Wireless Knowledge is in trials with its service. Currently, services are being offered only over WAP (Wireless Application Protocol) and browser-enabled phones. However, we understand that we can expect to see some packet-data offerings as well.

GTE, AirTouch, Bell Mobility, and others are taking part in these circuit-switched trials to enable their customers to remotely access their own corporate data. While WAP phones are the first to have been deployed, Infowave's software can duplicate much of the BlackBerry functionality in a RIM or Motorola two-way pager and then some. Infowave enables users to turn their email forwarding on and off directly from the pager and to access, for example, a corporate database to look up a name and number that might not be stored in the pager.

Conclusion

The OmniSky service has been well thought out and implemented. For a Palm V user with POP3 email who believes that email is as mission-critical as voice mail, this service is, without a doubt, a "must have." OmniSky has put together a great first offering, and while it is hyping its capabilities and coverage a little more than we would like, OmniSky service will be attractive to many of today's Palm V users. It is sufficiently robust that some people who are interested in mobile access to information might even go out and buy a Palm V in order to be able to sign up for the service.

OmniSky puts the heat on the other wireless portals and wireless solution vendors. As far as we are concerned, OmniSky has confirmed to the wireless world that packet-data service fees will be flat rates in the U.S. This is a significant factor as Sprint PCS, Bell Atlantic, and others turn on their circuit-switched data services that are, at the moment, priced by the minute.

OmniSky, GoAmerica, Wynd Communications, American Mobile, BlackBerry, AT&T Pocket.Net, and Bell Atlantic now provide flat-rate services. The remaining CDPD carriers will be offering flat-rate wireless Internet access for notebook computers. Missing from the flat-rate packet-data action are SkyTel, PageMart, PageNet, BellSouth, and Palm.Net.

The two-way paging carriers—SkyTel, PageMart, and PageNet—might be able to kid themselves when it comes to per-message pricing, but BellSouth and Palm.Net will have to hop onboard the flat-rate train in order to compete in a packet-data world that has decided that flat-rate pricing is what the customer wants. Isn't the customer always right?

Qualcomm's Preferred Wireless Data Technology Is Not 3G

by Barney L. Dewey

Ten years ago this month, when Qualcomm first demonstrated CDMA technology for cellular phone use, it was met with much skepticism as a relativity unknown company with a new and unconventional technology. Today, CDMA is recognized as the best wireless air link technology and it has been adopted for 3G standards. I just returned from Qualcomm's anniversary event where Qualcomm demonstrated High Data Rate (HDR), its latest technology.

HDR should not be confused with Qualcomm's CDMA 2000 1XRTT (1X) technology that many service operators are planning to implement in 2000/2001. "1X" (don't you love these great marketing names?) is the first major change to the cdmaOne technology that has been implemented widely in the U.S. and Asia. This enhancement is considered a "no-brainer" for service operators to implement. By simply replacing existing channel cards with 1X cards, they increase their capacity per cell site by 1.5 to 2 times, nearly double battery life for handsets, and gain packet-data capability of 153 Kbps.

HDR Technology

HDR is a data-only CDMA technology that supports data rates of up to 2.4 Mbps to the mobile device, with a return rate of 153 Kbps. These rates are achieved using the same RF and supporting technology used by today's cdmaOne. By simply adding an HDR channel card to an existing cell site, HDR is available. HDR does require a separate 1.25-MHz RF channel, so for this plug-and-play approach to work, the service operator needs to have the spectrum, the base station RF power capacity, and the backhaul capacity to carry the data traffic to the Internet. The spectrum issue is essentially nonexistent for Personal Communications Services (PCS) licensees, but it can be a significant problem for 800-MHz cellular operators in densely populated areas.

HDR is a data-only CDMA technology that supports data rates of up to 2.4 Mbps to the mobile device, with a return rate of 153 Kbps.

By simply adding an HDR channel card to an existing cell site, HDR is available.

Qualcomm has based the HDR backend on standard Internet Protocol (IP) technology. When the data comes out of the HDR channel card, it goes to a standard IP router and to the Internet. Qualcomm's approach provides for lower cost, wide support, and availability of the high-volume Internet backbone technology. The downside is an integrated billing component, which could be an issue, depending on the billing model that is adopted by the service operator. Of course, if data is offered at a flat rate (as we believe it must be for broad acceptance) then this simple low-cost approach is the winner all around.

Qualcomm has based the HDR backend on standard Internet Protocol (IP) technology.

Qualcomm gave both a fixed and a mobile demonstration. The demonstrations used an 8-QPSK modulation system (quadrature phase shift keying, a digital frequency modulation technique that

is fairly resistant to noise) that had a maximum data rate of 1.8 Mbps. The final HDR specification calls for 16-QPSK modulation, which is capable of a peak data rate of 2.4 Mbps. One engineer told us that when they started field-testing, they discovered that the error rate was so low that they were "leaving capacity on the table." Their goal was a packet error rate of around 1% in a fixed, single-antenna system. Anything lower means that there is too much margin in the system and it is not as spectral-efficient as possible.

Qualcomm gave two reasons for why a service operator would want HDR.

For the fixed demo, there were five computers connected to prototype HDR modems. Qualcomm had two HDR cell sites in operation. One cell site was dominant for the fixed demo. Web surfing, file downloading, streaming audio and video, and email were demonstrated. The effective throughput was about 400 Kbps, or about two-thirds of my home DSL line. This was amazing for a wide-area data technology. The cell site was a little more than two kilometers away on the other side of the hotel wall.

Qualcomm had a specially-equipped van to demo HDR in a mobile environment. It had a standard computer system using Windows NT, and a diagnostic system that displayed the received HDR signal. The same real-world tests that were performed for the fixed demo were performed in the van. It was difficult to observe a difference. However, the diagnostic system displayed the instantaneous maximum data rate, the two-second and twenty-second average data rate, packet error rates, and other CDMA parameters. With the graphical display, it was easy to see that mobile data rates dropped as the van moved around the city. Of course, there were many factors responsible for the data rate fluctuation from around 70 Kbps up to 1.8 Mbps (the maximum for the demo configuration). It was very impressive for a mobile data system.

Business Case for HDR

Qualcomm gave two reasons for why a service operator would want HDR. The first is operational. Qualcomm pointed out that one of the most difficult things a service operator must do with a mixed voice and data system is to determine who gets service when a cell sector nears capacity.

The network characteristics of voice and data are very different. Voice requires a continuous low-speed data path (4 Kbps) with very little latency (40 microseconds). Data, on the other hand, is bursty. Data bursts require high-speed data transfer (128+ Kbps) but can have a relatively long latency (200 milliseconds is acceptable). Qualcomm claims that mixing voice and data traffic on a network requires compromises that result in network utilization that is less optimal than with separate networks. In other words, it is more spectral efficient to use two 1.25-MHz CDMA RF carriers—one for voice (1X) and one for data (HDR)—than two 1.25-MHz voice and data RF carriers (1X).

The second business case is more traditional. Without going into all of the details, Qualcomm's case study showed a high internal rate of return of 35%+ after three years, growing to 50%+ over seven years. The model assumes

that HDR overlays an existing CDMA system with 20% more cell sites added. The model also assumes that mobile users will pay a flat rate of $40 per month in 2000, with the monthly rate dropping to $32 in 2007 for high-speed wireless data access. I like the flat-rate approach used in the model. This appears to be a winning price point for the customer that also provides the service operator with a good return.

HDR Roadmap

Qualcomm announced two HDR chips for handsets. They are both 100% compatible with its existing chipset. Handset manufacturers can literally stuff the board with one of the new chips in place of the current chip and have an HDR handset. The ease for handset vendors to bring HDR products to market is a significant winning factor for HDR compared to GSM/TDMA GPRS and EDGE-based technologies where handsets require new designs that will drive their cost up and increase their time to market.

The ease for handset vendors to bring HDR products to market is a significant winning factor for HDR.

The iMSM 4500 supports HDR, IS-95A, and IS-95B. IS-95A is the current cdmaOne technology used throughout the world, while IS-95B is a version of cdmaOne that supports 64-Kbps data that is being implemented in Korea and Japan this year and early next year. It appears that U.S. service operators will pass on IS-95B and go directly to 1X. The iMSM 4500 is scheduled for full production in Q1 of 2001. I would expect HDR handsets based on the iMSM 4500 to be available in Q2 of 2001.

The iMSM 5500 supports HDR and 1X technologies and is scheduled for production in Q3 of 2001 with HDR/1X handsets available by late 2001. A handset using iMSM 5500 technologies could easily roam between 1X data systems (153 Kbps) and HDR systems (2.4 Mbps). This puts HDR well ahead of EDGE for TDMA and GSM systems (see Figure 1 and www.wirelessroadmap.com).

Conclusion

Qualcomm can hardly lose with wireless data for its existing customers. If a service operator is completely voice-centric and follows the 3G roadmap from cdmaOne to cdma2000 1XRTT to cdma2000 3XRTT, Qualcomm can sell the new technology—mainly chips that handset and infrastructure manufacturers use—and technology licenses to other chipmakers.

If the service operator decides to add HDR, Qualcomm also wins. Qualcomm told us that it will charge the same licensing fees for 1X and HDR, meaning that if a handset has both, and costs the same as a 1X-only handset, there will be no additional licensing fee for HDR. If the handset manufacturer charges a premium for HDR, the license fee will go up. Clearly, Qualcomm wants to keep the price of HDR as competitive as possible.

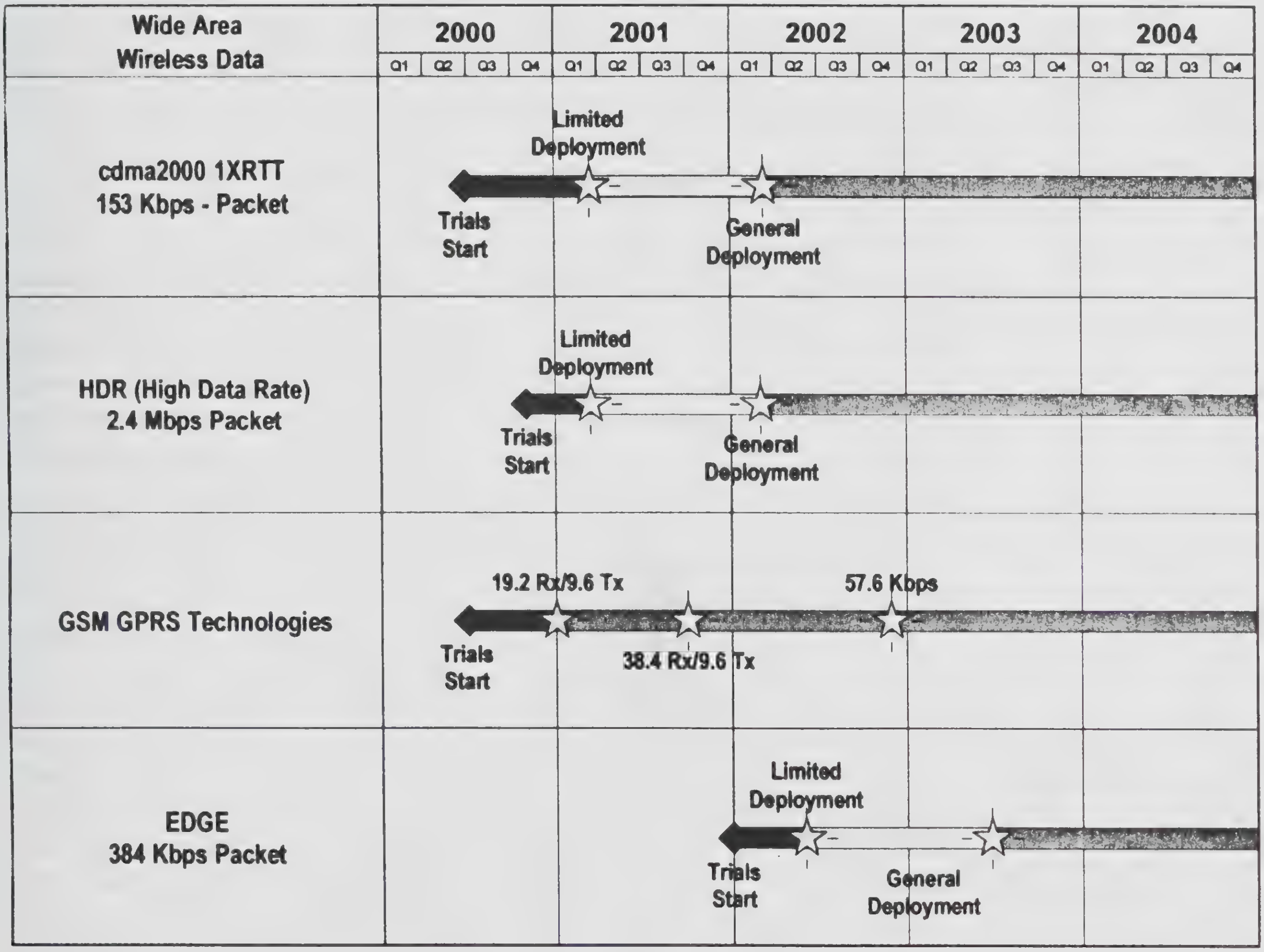
Qualcomm can hardly lose with wireless data for its existing customers.

The combination of 1X and HDR technologies appears to provide all of the technology capabilities and efficiencies of the ultimate 3G standards. Since both technologies are considered to be minor upgrades to existing cdmaOne systems, Qualcomm is providing CDMA service operators with 3G capabilities at a fraction of the cost that GSM or TDMA service operators will have to spend to upgrade

to 3G (called wideband CDMA or W-CDMA). This combination of 1X and HDR also beats 3G to market by at least two years, and probably three to five years.

Qualcomm is not "betting the company" on HDR as it did ten years ago with CDMA—it doesn't need to. Many are criticizing HDR for not being a standard and not being on the 3G track. But CDMA was not a standard ten years ago, either. Do not count HDR out. If it makes the most economic sense to provide 3G capabilities alongside 1X, the service operators will adopt it. Watch for HDR trials over the next two years as a bellwether indicator of whether high-speed wireless data will be widely available by 2002 from CDMA service operators.

Figure 1.
Wide-Area Wireless Data Roadmap



This roadmap illustrates our understanding that high-speed packet data will be available from CDMA operators long before GSM and TDMA operators can offer similar services. Because EDGE may be too late to market, it is possible that TDMA operators, such as AT&T Wireless and BellSouth Cellular, may be forced to implement 3G systems in the 2002 timeframe if wireless data becomes a critical offering for wireless service operators.

The combination of cdma2000 1XRTT and HDR provide the CDMA operator with all of the capabilities of a 3G system. It appears that CDMA operators can offer 3G-like data services early and at a low implementation cost, giving CDMA operators a significant cost advantage over TDMA and GSM operators. This will only be a significant competitive advantage in the U.S.—the only market where the technologies compete head-to-head. In Europe, all of the major wireless service operators use GSM, so they are on a level playing field.

Microsoft and Ericsson: A Match Made In Heaven?

by Andrew M. Seybold

On December 8, 1999, Microsoft and Ericsson announced a strategic partnership to develop and market end-to-end solutions for the wireless Internet. This partnership is based on "shared visions of convenient and fast access to information anytime, anywhere, from any device."

The announcement states that Ericsson will provide its Wireless Application Protocol (WAP) stack to Microsoft and will adopt Microsoft Mobile Explorer for "feature phones," giving operators, developers, and consumers more choice and functionality in developing, delivering, and accessing wireless information and services.

This is interesting because Microsoft obviously wants its code embedded in wireless phones. However, from where we sit, this is not the real meat of the partnership. The balance of the announcement addresses what we believe this deal is really about: "The joint company will focus on building, marketing, and deploying solutions that utilize Microsoft Windows NT Server and Exchange platforms, and Ericsson's infrastructure and mobile Internet technologies. This will give wireless operators access to the most reliable and feature-rich communications and mobile data infrastructure."

This paragraph describes the most important aspect of the agreement. Certainly, Microsoft is interested in being included in as many of the 600 million wireless phones that will be sold by 2003 as possible. But from a strategic position, Microsoft wants to break into the areas of infrastructure where Unix and proprietary backend operating systems have been king since the beginning. Carriers may use Microsoft's operating system in their offices for their employees, but until this partnership with Ericsson, NT stood little if any chance of finding its way into carriers' backend equipment.

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There are questions as to whether NT is sufficiently robust to be used in carriers' switches moving forward, but Microsoft would not be given the opportunity to prove itself one way or the other without a partnership such as this. Ericsson has been a "backend" provider for many years and carriers trust Ericsson's "switches" and its other backend components. While unproven in this area, Microsoft certainly has an eye on this lucrative market as carriers plan to change their backend systems from computers that look and feel like switches to Internet Protocol-type backends where switches are replaced with routers.

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If Microsoft controls corporate servers which are, in turn, connected to carriers' servers to move data to and from corporate workers no matter where they happen to be, you can see that this partnership with Ericsson is an important step for Microsoft. Others are sure to follow. If Microsoft is to become the leader in

the backend business, it will also need to have agreements in place with Nortel (especially Nortel Networks), Lucent, Motorola, Compaq's Non-Stop server group, and others. Ericsson is a good start, but by itself this is not enough to assure Microsoft of the growth it wants to achieve in this market.

The Microsoft/Ericsson partnership is an important development for Ericsson as well.

The Phone Boss, The Phone

Most of the press has spent more time on the implications of Microsoft and Ericsson teaming up on the handset side of the business because Ericsson sells a huge number of these devices. Even so, Ericsson has been losing market share in this area to Nokia, Motorola, and even Qualcomm (even though Qualcomm's phone business is for sale). Ericsson has been slow to develop and deliver new phones, but in recent months it has introduced several new products including its own "world phone."

The threat to Microsoft from AOL could also be a threat to Ericsson and other device suppliers.

Ericsson has been instrumental in the WAP Forum and has embraced WAP with vigor, although it is not yet clear exactly how WAP-enabled phones will be accepted. It is also a founding partner and the inventor of the Bluetooth "wireless wire" technology that will have a significant impact on future information appliances. Ericsson is a major investor in Symbian, which, with its EPOC operating system, has been seen as a real threat to Microsoft's desired dominance in the wireless device operating system arena.

Obviously, Ericsson has come to realize that in order to regain market share and to grow its business, it needs to partner with a number of companies—even companies that, until recently, it considered its competitors. The Microsoft/Ericsson partnership is an important development for Ericsson as well.

Competition

Meanwhile, Nokia, one of Ericsson's strongest competitors, has been forming alliances of its own and has announced partnerships with the Palm division of 3Com to work on pen-based wireless devices, and with IBM to share WAP server technologies. Nokia has also invested in Symbian, as has Motorola.

America Online's vision of AOL everywhere has been advanced through AOL's recent investment in Gateway, and its partnership with Palm, Motorola, and DirecTV.

The threat to Microsoft from AOL could also be a threat to Ericsson and other device suppliers. AOL, which swallowed Netscape and recently purchased Tegic for its predictive keyboard and instant messaging application for phones, might be viewed as the most significant threat to Microsoft in both the information appliance and home entertainment areas. Having partnerships with folks who make the devices that we will be buying and using while mobile makes a lot of sense from Microsoft's perspective, too. Netscape has been a thorn in Microsoft's side for years now. AOL with its new partners—especially Netscape—should be considered a legitimate threat to both Microsoft and Ericsson.

Symbian Doth Protest Too Much

When it announced its deal with Palm Computing, Nokia, as well as Palm, issued separate press

releases stating that this new relationship would not pose a threat to Symbian or the EPOC operating system. Symbian, for its part, became very pro-active and called reporters to make sure that we heard its side of the story. Unfortunately, Symbian made some claims about a separate deal with Palm that turned out to be wishful thinking and not fact.

Moments after the Microsoft/Ericsson partnership was announced, the Symbian public relations machine once again geared up to war-room status. We received email messages and phone calls asserting Symbian's position that this deal had no impact on its relationship with Ericsson. The fact that Symbian felt it necessary to launch a campaign leads me to believe that even if there is no impact on Symbian as a company, or on Ericsson's use of the EPOC operating system, Symbian is becoming paranoid and doesn't believe its own PR.

Conclusions

Microsoft has entered into a joint venture with Qualcomm (Wireless Knowledge), negotiated a deal with BT in Europe, and has an arrangement with NTT DoCoMo in Japan. Send-it has been purchased; and Ericsson is now a partner. Microsoft is certain to continue such activities as we move toward a world where the number of Internet appliances and wireless devices that are capable of accessing the Internet overshadows the number of PCs in use throughout the world. Microsoft needs partners such as Ericsson, and Ericsson needs partners such as Microsoft. The question is whether partnerships such as these will bear fruit soon enough to tip the scales of power. Stay tuned!

Microsoft is certain to continue such activities as we move toward a world where the number of Internet appliances and wireless devices that are capable of accessing the Internet overshadows the number of PCs in use throughout the world.

Table 1.
A nearly-complete listing of companies that have announced wireless initiatives.

Major Portals: MSN, Yahoo!, AOL

Information Aggregators: InfoSpace (Saraide), MyPhone, CMG Telecommunications

Transaction Service Providers: SmartServ Online, Aether Technologies, W-Trade

Computer Software/Manufacturers: Lotus, IBM, Mobile Connect, Microsoft, Oracle, SyBase

Wireless Portals: Palm.Net, OmniSky, AvantGo, smartRay.com, @mobile, myAladdin.com, Intelligent Information Inc., Gray Cell, Inc.

Handset or Palm-Size-Based Mobile Application/Service Provider: Wireless Knowledge, IQorder.com, Barpoint.com, vStream

Desktop-based Mobile Application/Service Providers: Personi.com, BuyDesk.com

Technology Providers: Nettech, InfoWave, InfoMove (automobile market)

Infrastructure: Ericsson, Nortel Networks, Nokia

Wireless ISPs: BellSouth Wireless Data, BlackBerry/RIM, American Mobile ARDIS, GoAmerica, Wynd Communications, Paradigm4

Service Operators: AT&T Wireless, AirTouch/Vodafone, SBC Wireless, Bell Atlantic Mobile, BellSouth Mobile Systems, GTE Wireless, Alltel, Ameritech Cellular Services, Sprint PCS, Nextel, BellSouth Wireless Data, American Mobile ARDIS

Wireless IT/Comdex/Bluetooth Developers Conference

by Andrew M. Seybold

Since our last issue, we participated in and attended three conferences aimed at the wireless space: CTIA's Wireless IT; Comdex, which had a mobile component and a few wireless aspects to it; and the Bluetooth Developers Conference.

Wireless IT is clearly the industries' wireless data show and it should be even larger next year.

Wireless IT

The Outlook has been a sponsor of CTIA's Wireless IT since the beginning. The CTIA recognized the need for a show where CIOs and IT managers could go to get information about wireless data as well as wireless voice. In the early years, the show, which started out as Wireless Apps, was held in Las Vegas and it was a slow starter. Then the CTIA became serious about the event, hired a vice-president of trade shows (Rob Mesirow), and changed the venue to Silicon Valley.

At Wireless IT 1999, the number of exhibitors was up, as was the number of attendees. Our Wireless Data University, held the day before Wireless IT, was the best attended so far, and the comments heard in the hallways and trade show area were all positive. The hard work and perseverance of the CTIA and its partners (including us) appears to have paid off. I believe that Wireless IT is clearly the industries' wireless data show and it should be even larger next year.

The show floor was all about data, from Wireless Application Protocol (WAP) to Bluetooth and everything in-between.

The sessions were well attended, as were the exhibits. As part of the press contingent, we saw a number of products and services that were being shown in hotel suites but not on the show floor. These included OmniSky's first offering (see page 3) and several others that are about to be announced. The show floor was all about data, from Wireless Application Protocol (WAP) to Bluetooth and everything in-between. The mood was up, and business was being conducted not only between exhibitors and attendees, but between vendors as well.

Walking the floor, you got a sense that wireless data is real and that it is about to become easier to implement and to use. Even though WAP phones were everywhere (this could have been viewed as the WAP coming out party), the capabilities of the first generation of these phones were being realistically portrayed and the hype was being contained fairly well. We found this refreshing. Several things did puzzle us though. For example, NeoPoint, which is busy building all of the NeoPoint 1000 (Sprint PCS) and NeoPoint 1600 feature phones it can, has decided to enter the wireless portal business with a portal called "MyAladdin."

The service is interesting, and the folks at NeoPoint did a good job of showing it at Wireless IT. But, to me, it doesn't seem to make sense from a business perspective to sell phones to carriers and then provide a backend wireless portal that in many cases will compete with these same carriers. The

other issue that I have is that while using my NeoPoint 1000 over several weeks now, I was discouraged to learn that it does not support Microsoft Outlook 2000, only Outlook 97/98. When I inquired about this, I was told that NeoPoint is a small company and that it would be rolling out support sometime in the future. The early adopters who will be the first to try the NeoPoint phones are the same folks who always have the latest software on their desktop systems. We have been using Outlook 2000 for most of this year. It is not a new product, and it is difficult to imagine why the NeoPoint folks didn't start with the latest version.

In any event, Wireless IT was the coming out party for both wireless data and the show. The CTIA did an excellent job. We enjoyed being able to walk from one vendor's booth to another and still be in the world of wireless. We didn't have to wander about to find wireless among the multimedia and other technologies, as we must at Comdex and CES.

Comdex/Fall

This show is still so large that it is impossible to see everything, and it is difficult to get around even though the number of exhibitors and attendees is down from only a few years ago. The folks who now own Comdex don't seem to understand that if you put on "Comdex" shows all over the world that you dilute the importance of the two main shows. The previous owner learned this the hard way more than ten years ago.

Comdex folks do try to group exhibitors in areas of interest, but the "Bluetooth" pavilion was in the back of the Main Hall while the wide-area network folks were in the North Hall. Go figure.

The major "happenings" were the keynote where Bill Gates discussed the importance of wireless voice and data capabilities going forward, announcements from OmniSky and AT&T Wireless and, at least according to one reporter, our Wireless Dinner. This issue provides a recap of the OmniSky offering, and while AT&T was on the stage with OmniSky, it was also announcing its own re-launch of the AT&T PocketNet service. This PocketNet, while it is still being offered over CDPD, is different from the previous service.

The major "happenings" were the keynote where Bill Gates discussed the importance of wireless voice and data capabilities going forward, announcements from OmniSky and AT&T Wireless and, at least according to one reporter, our Wireless Dinner.

First, WAP capabilities are much more robust today than they were several years ago. Second, the new phones are multi-band and multi-function. Both Mitsubishi and Ericsson are building the handsets, which include CDPD (for data), analog cellular, TDMA cellular, and TDMA PCS voice services. Getting all of this inside a single phone is quite an engineering challenge. Still, WAP capabilities are available only in areas where there is CDPD coverage (about 54% of the U.S. population) while the voice services are available in a much broader coverage area. Because of this, I think that many of the service's initial customers will be less than pleased with their ability to access their data.

In any event, I am not a believer in data-capable phones such as the AT&T offerings that have no ability to store calendar, phone book, and perhaps to-do information. As I have said before, I think that using a WAP-enabled phone without any data storage will be a less-than-great experience. Suppose that I

The Comdex folks are already "inventing" pavilions for Internet companies and Bluetooth companies, and preparing separate exhibit space for the communications companies.

The Bluetooth folks were able to hold a successful event in L.A. because Bluetooth is a hot topic—not because L.A. is a place people want to visit.

am in a meeting and I need to schedule another meeting with you next week. Oops, we're not in CDPD coverage so I don't have access to my calendar! At least with the NeoPoint 1000 or 1600, the Nokia 7110, or Palm VII, if I am out of coverage, I still have my calendar and contacts with me. In Europe, where GSM coverage is almost pervasive, a phone without storage capability might suffice. However, in the U.S., even on the AT&T network, I think that phones without memory will cause more problems than they solve.

Comdex was Comdex. What can you say? There were lots of folks exhibiting their wares, and the communications companies have tentatively crossed over into this show. Yes, some had large booths, but they were not yet a part of "mainstream Comdex." This will soon change. The Comdex folks are already "inventing" pavilions for Internet companies and Bluetooth companies, and preparing separate exhibit space for the communications companies. Next year, my bet is that there will be just as much action and excitement in the communications hall as there is in the computer hall.

Bluetooth

The Bluetooth SIG (now 1,321 members strong) hosted a developers conference in downtown Los Angeles early in December. Most high-technology conferences that are held in L.A. do not attract many attendees. Traffic congestion, travel times, and problems with parking make it the worst city in the U.S. for a conference. The Bluetooth folks were able to hold a successful event in L.A. because Bluetooth is a hot topic—not because L.A. is a place people want to visit. The attendance figures I heard from the show management indicate that more than 1,800 people attended the three-day event.

I was amazed at how the conference group turned on its heels. Only shortly before the event, Microsoft finally agreed to join the Bluetooth SIG. Yet there was a Microsoft keynote and a number of sessions in which Microsoft was featured. The logistics involved in making it appear that Microsoft was part of the event from the beginning must have been complex.

The show itself was well run. The sessions started on time, ended on time and were, for the most part, valuable to those attending. My track was devoted to the impact of Bluetooth on other industries and how Bluetooth technology can be applied to other industries. I began by making a plea for "out-of-the-box" connectivity. If Bluetooth is as difficult to configure as IrDA (infrared), no one will bother. I also spent some time on the voice aspects of Bluetooth and how important voice command-and-control will become once Bluetooth is built into phones.

Other sessions that I moderated in the same track were designed to provide developers with ideas about what types of things could be done with Bluetooth. These ran the gamut from specific vertical-market applications to using Bluetooth as the wireless wire for high-speed Internet connections from hotel rooms and public areas. The folks from Sentranet who were discussing this approach have gone far beyond the typical Bluetooth solutions. They have developed a way for hotels to gain

higher-speed Internet access without impacting the number of phone lines they currently have installed and without having to run new cables to the rooms, then how to make use of Bluetooth for the last ten feet of the connection. I was impressed with this presentation because it was the only one that I heard where Bluetooth technology had been integrated into a complete product offering.

Walking around the show floor was an interesting experience. The show folks had taken the approach of providing small demo stations instead of booths. Each company's space was the same and companies were grouped by types of products. IBM and a few others did have more than one booth, but not the big, overpowering booths that make the rest of the folks in the room look like small-time operators. The effect was one of balance, with the smaller companies having the same amount of floor space as the big guys. This type of exhibit hall layout was also used at the Palm Sources conference in early October, and it makes a big difference.

The show folks had taken the approach of providing small demo stations instead of booths.

Walking around the hall, I was struck by two things. First, many companies are entering the Bluetooth business in one form or another. From radio modules to baseband modules, to test equipment, hundreds of companies are preparing for Bluetooth. Tektronics and other test equipment vendors were showing equipment that is capable of measuring Bluetooth radios, displaying the modulation, and providing other input on how a Bluetooth unit is performing. Radio companies were showing their Bluetooth radios and radio modules, baseband companies were showing the baseband element of the devices, and several were showing complete radio modules. Ericsson and others had "pods" attached to their cell phones and were using Bluetooth headsets to "talk" to cellular phones. There were PC Cards sending and receiving data, and even several devices sporting built-in Bluetooth modules.

The first version of Bluetooth is not as exciting as the promise of Bluetooth. This first version only provides a linkage between two devices—a phone and a wireless speaker microphone for example—or a phone and a notebook computer. The promise of Bluetooth is to be able to provide interoperability between a multitude of devices. When you walk into your office with your notebook in hand, it would recognize and synchronize with your desktop. When you are out of the office, the notebook can use your cellular phone to dial up a wide-area wireless network connection. When you arrive at a meeting room, you and your fellow workers can form an ad hoc network. But we will have to wait for all of this. Today, it's just one-to-one Bluetooth stuff.

The first version of Bluetooth is not as exciting as the promise of Bluetooth.

Conclusions

The last quarter of 1999 was filled with mergers and acquisitions including MCI/WorldCom and Sprint; joint ventures such as the Microsoft/Ericsson partnership; product launches from companies such as OmniSky; and trade shows that are important to the growth of wireless data. With a year that ended with this much wireless activity, it is hard to imagine what 2000 will bring!

Letter To The Editor

"Where are the 802.11 groups in all of this?"

In a recent issue, we wrote about Home/RF and the Bluetooth alliance possibly establishing interoperability standards by mid-2000 and wondered, in print, "Where are the 802.11 groups in all of this?" This question elicited the following response from Cees Links, the gentleman who is responsible for Lucent Technologies' wireless LAN strategy.

A Short Brief on Bluetooth.
Nokia, Ericsson, Intersil, and Lucent have done joint coexistence testing. The conclusion is that using both Wi-Fi and Bluetooth in the same machine at the same moment will create mutual interference. But if the radios are somewhat apart (five feet), and the application is kept separate, there is reasonable coexistence.

Currently there are two motions going on.

Technical solutions are in the works!

1. Bluetooth 2.0 is looking at including coexistence with IEEE 802.11b, and a study group has started as part of the charter.
2. IEEE 802.15 has in its charter to create a PAN (Personal Area Network) that coexists with IEEE 802.11 and is looking at Bluetooth.

Therefore technical solutions are in the works!

Where does this leave the market in the meantime? Considering that the first application for Bluetooth is the wireless connectivity of a cell phone to a computer, and that this application is mutually exclusive from the Wi-Fi (LAN) application, the situation maybe relatively okay to get out of the gate with Bluetooth. But harmonization will be coming!

Referring to the comment in the last paragraph, wireless LAN organizations "unite and grow," I would like to look at Bluetooth a little differently compared to IEEE 802.11 and HomeRF. It seems to be the doom of mankind to always develop two standards, and then slug it out in the market: recent example, IEEE 802.11 (now Wi-Fi) and HomeRF. Unite and grow would be great but, unfortunately, the technologies are too different, so it will be most likely fight (for both) and win (for one).

Although Bluetooth marketing is making some noises about going into the LAN space, the technical people are more skeptical and are refraining from characterizing this standard as a LAN. Actually, I can foresee one radio doing both Wi-Fi (for LAN) and Bluetooth (for PAN) and have a MAC switching the two based on usage.

Regards,
Cees Links
General Manager
Lucent Technologies

Mobile Implementation

by Victor Wortman

Chicago's Bank One Technology and Policy Have to Blend

The wireless data/mobile computing industry has solved many technological problems to get where it is today. But in fact, technology is but one half of the equation. The other is the broad business decision process within the corporation, where often there exist justifiable differences of opinion as to the right way to proceed.

The following story discusses such a real-life situation, shared with The Outlook by Bank One's (Chicago) Raymond Demich, vice president and division manager of commercial bank marketing and sales systems, and two of his key staffers: Winston Ballard, who was team leader on a new mobile application, and Gary Dzik, his lead technician.

Bank One, formerly The First National Bank of Chicago, is the largest bank in the Midwest, as well as the fourth largest bank holding company and third largest commercial bank in the U.S. It has a presence in forty states, retail operations in fourteen states, and fifteen international offices.

On any given day, several hundred of Bank One's sales representatives are in the offices of commercial customers, structuring credit lines, establishing new accounts, assisting with deals, and so on. Usually, they carry printouts of the customer's history with the bank, account status, and other information relevant to the business at hand. While the sales reps bear primary responsibility for customer relations, collectively, more than 3,000 sales, product specialist, and support people are engaged in this front line commercial banking activity.

Customer Knowledge in Detail

The Sales & Marketing Systems Division of Bank One is an Oracle shop of long standing, and several years ago, Demich and his crew began work on a huge project—a Customer Knowledge Center that would serve as a repository for every detail known about a given large corporate customer. The Knowledge Center was launched in early 1998 in a browser model. The next phase of the Knowledge Center was launched in early 1998 as a prototype of Web-enabled access and went into production in May of 1998.

Recently, Demich's 28 Oracle developers completed another phase that enables the Knowledge Center to be accessed by mobile clients, either conventionally or wirelessly. This phase is currently on the shelf, awaiting a management decision.

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Because mobility is important, sales reps typically have been furnished with laptop computers (IBM, Dell, HP). Besides their paper printouts, many reps load the material they need and take the machines with them so they can work while they travel.

Demich says the Customer Knowledge Center project began with no clear mobile strategy, but that early on, it became apparent

that it would be desirable to have one.

To Buy or Not to Buy

"With the amount of work that was going on, we determined that we would rather purchase a package and keep our focus on the major project," he says. "The package we wanted would take care of the material that people really needed to take on the road—calls, contacts, calendars, and task lists. We examined ACT!, Microsoft Outlook, and Lotus Notes and decided to try to integrate Outlook with our system."

> *"With the amount of work that was going on, we determined that we would rather purchase a package and keep our focus on the major project."*

Winston Ballard and Gary Dzik were given the assignment, with Ballard the Project Manager and Dzik the lead technician. They spent a year on it before deciding to abandon the approach, primarily because MS Outlook was not supported within the company. Further, they found that they would have had also to purchase and implement a synchronization product, concluding that, given the uncertainty of support, it would not be worth the effort.

Oracle8i Lite, with its Web-To-Go feature—Oracle's scaled-down, Web-enabled platform for mobile computing—had also been considered earlier, but had been rejected as unready. But while attending an Oracle show in May 1999, members of the development team had an opportunity to reappraise Oracle 8i Lite and Web-To-Go, which they had been told had been improved significantly. They watched a demonstration and concluded that it was worth a try.

Small, But Mighty

Oracle8i Lite is designed for mobile e-business applications requiring seamless synchronization with central databases and is directed toward three market segments: mobile computing, embedded computing applications, and information appliance applications. The Java-based Oracle8i Lite strips out much of the overhead associated with the larger program, resulting in a relational database management system of only 50 kilobytes. The Web-To-Go feature, a Web server, occupies only twenty additional kilobytes of space, making for economy of resources and rapid handling of data.

> *Oracle8i Lite is designed for mobile e-business applications requiring seamless synchronization with central databases.*

"We had a major investment in Oracle and wanted to stay with the database application if we could," Demich says. "We like the concept of writing applications once and using them widely. When we did our evaluation, we found that since it is Java-based, Oracle8i Lite would allow us to do so. We simply recompile the application and it is ready for use."

The mobile solution is comprised of the Oracle8i Lite database, IConnect, which manages replication of the Oracle8i software on the central server, and Web-To-Go which manages, deploys, and sets up the servlets—essentially, function-specific Java applets—for the mobile device, effectively creating a personal Web server.

Fast Turnaround

Oracle demonstrated Oracle8i Lite with Web-To-Go to the Bank One team in June, and they installed it in July, commencing work immediately. Once again, Ballard and Dzik led the work on the mobile solution.

"Technically, we only had to change the location and means for extracting the data," Ballard says. "We have our own data connection pool, which we use in preference to Oracle's. We were able to design the application so that when users accesses Web-To-Go, they are automatically in the right place."

Dzik spent only two weeks tweaking the system, slightly modifying the data connection and data pool processes, the image sources, and how servlets were to be named. To test their work, they first ran it on the standard Web server, without Web-To-Go, and then migrated it downward to the smaller system.

Ready...Set...Stop

The team devoted another four weeks to the development and naming of fifteen servlets that reside between the Internet browser and the database. The servlets receive requests for specific information from the browser, retrieve the data from the database, format it as necessary, and pass it back to the browser for display on the client device.

There are servlets for a variety of activities, and for mobile users, they include calls, task lists, calendars, and address books. Under development is another for deal tracking, through which sales representatives can obtain all data pertaining to their deals, enabling them to actually structure the deals on-site in the customer's office.

The mobile solution is device-agnostic and works either in connected or wireless remote mode. It was completed in August, and tested live under real-world conditions on "Big O," the full-scale version of Oracle8i.

"We went on the large site, added some contacts, and then went to mobile sites to check whether we could see the data," Demich says. "Then we went off line and repeated the process, modifying the data and going back online to look at it again."

Everything checked out, and shortly thereafter, a proof-of-concept demonstration was given to potential users. It was ready for deployment ... and why not?

Pending Issues

Why not? Because in addition to being an Oracle shop, Bank One is also a Lotus Notes shop—and Notes is the email and calendaring system of record for all employees. Hence, internal issues remain that must be resolved before the primary user executives are willing sign off on deploying the application.

"Notes is here to stay," Demich says, "and the Customer Knowledge Center is here to stay. We are not sure which entry vehicle will prevail, and people now use both systems. Primary users will not roll with a single final solution until they are sure that it is the one that will be adopted."

"It goes back to how you want to deploy," he says. "We created a customer relationship management system that accommodates every possibility that we can imagine, including mergers and acquisitions, and removed any dependency on PCs, operating systems, or browsers. It will run anywhere, and the applications are fully extensible."

Nevertheless, he says, all sales activities revolve around a calendar,

The mobile solution is device-agnostic and works either in connected or wireless remote mode.

in addition to being an Oracle shop, Bank One is also a Lotus Notes shop ... internal issues remain that must be resolved.

contacts, calls, and tasks, which are also handled ably by Notes but not integrated with the centralized Customer database.

"We do not want to be invasive," he says. "Notes is currently the corporate standard, and ideally, we can integrate the two, placing all of the information in one place and making it available to the sales force in the easiest possible way."

Wireless Data Ahead

The Customer Knowledge Center solution is now fully capable of wireless data deployment, but the only connection mode currently available is through hard-wired connections. But that can change, and may do so quite soon.

"We can support either connected or nonconnected operations and we will soon begin looking at the wireless options," Demich says. "We would think of wireless deployment in about six months, using Oracle8i's Portal-To-Go feature. Portal-To-Go connects Oracle8i to the wireless data environment through the Internet and on to laptops, PDAs, Palm, and Windows CE devices. Because of hardware limits, different devices require different languages, and Portal-To-Go translates the content into the language required by the device."

Meanwhile, Ballard says, at least one primary user has obtained a Palm VII and is now using it. The device fits in with the wireless strategy, he says. Many field personnel are also using Palm and Windows CE devices independently.

Functionality Fits

"If they like the functionality, we want to assure them that our solution will work on these devices," he says. "We have not put the application on the Palm VII yet, but we have met with Oracle to see about doing so. We have seen an Oracle8i Lite application that runs on the Palm VII, so there should be no impediment. The key thing is to strip out only what is needed by the user and bring down the minimum amount of data."

Like those reps at another well-known financial institution, Bank One's sales people also measure success one deal at a time.

"Generally, the sales reps have told us that they can win one more deal per year that they might otherwise have lost, simply by having the information available," Demich says. "They also report that they have won deals that they might not even have been considered for previously."

Put that in the context of several hundred reps, add the speed and accessibility provided by anytime-anywhere wireless data communications, and you're probably looking at a really fine ROI—Return on Information, that is.

Many field personnel are using Palm and Windows CE devices independently.

"If they like the functionality, we want to assure them that our solution will work on these devices."

Mobiltorial

by Andrew M. Seybold

The end of 1999—and to some, the end of the millennium—is near. I am one of those who believe that we have one more year to go in this millennium, so the only big deal is how much of a problem the Y2K bug will be. We are certainly ready up on Outlook Hill with our auto-start, auto-transfer generator, our own well, a full propane tank, and enough two-way radio communications (both commercial and amateur) that we shouldn't have any problems.

Even though I have been involved in the computer business for more years than I want to admit, I am still puzzled by some of the predictions about the transition to Y2K. For example, why does an elevator care that it is January 1, 2000 as opposed to January 1, 1900? Do these elevators really know that they probably weren't around in 1900? Does something different mysteriously happen to them? No, they continue to move between floors, stop, open their doors, and let people on and off. How about traffic signals? This is another area in which we are hearing there might be problems. Why should a traffic signal care if it is 1900 or 2000? I guess that I simply do not understand.

I do understand about the man in New Hampshire who received a jury summons for January 20, 1900, or that my mortgage payment might be perceived as 100 years overdue if the mortgage program thinks that it is 1900. And I suppose that I can even believe that power grids really do need to know the precise date in order to function properly, or in order to handle billings. But most of the possibilities that are being bantered about appear to be so much nonsense.

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Why should a traffic signal care if it is 1900 or 2000?

CDMA

The CDMA voice-and-data systems of the world require a Global Positioning System (GPS) receiver at each cell site in order to function properly. If the GPS network goes down, the CDMA networks might go down as well. However, we are told by experts that the GPS system is solid and there is no problem. Thus, all is well in the world. I believe that any Y2K "bugs" that do bite will not pose any life-threatening problems and they will be fixed promptly. Y2K consultants who have made their fortunes over the last couple of years will become Y2K Leap Year Consultants and will continue to make money well into next year.

Merger Mania

During 1999, the wireless and computing industries began working more closely in a number of ways. WirelessKnowledge, Microsoft's joint venture with Qualcomm, has gone into beta testing, a new venture between Microsoft and Ericsson has been announced, Nokia and Palm have signed an agreement to work together, and Nokia and IBM have an arrangement as do Sprint PCS and Yahoo!, Dell Computer and Research In

Motion, American Mobile and SkyTel, and PageNet and BellSouth Wireless Data. MCI/WorldCom is getting back into the wireless business with its acquisition of SkyTel and Sprint as well as with an investment in Metricom. And the list goes on.

Companies that never thought that they would be working together are now working together.

The word "convergence" is overused, yet it is a good descriptor of what is occurring. Several industries are converging—wireless, computing, and information. It is difficult to talk about this convergence without resorting to the "buzz word" dictionary, but here goes. What is happening is that companies that never thought that they would be working together are now working together. Companies that traditionally were not competitors are now finding themselves in competition with each other. Most importantly—and this is the best part —companies are finding that they cannot be all things to all people no matter how big they are. They need to partner, acquire, form an alliance with, and otherwise work with those companies that are better at providing specific parts of the puzzle that are needed for end-to-end solutions.

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During 1999, we have seen many partnerships that have surprised us, but I can almost guarantee you that this is only the tip of the iceberg. We are just beginning to see how these industries will be affecting each other, how their respective companies will meld into larger yet more responsive entities, and how much money will be made and lost in 2000 and beyond. These are exciting times and, while I loathe buzzwords, it is more true than ever that we are in the midst of industry convergence, inflexion points where we learn how to cross the chasm from the early adopters to the early majority, and where companies learn that they need to provide end-to-end solutions for the mere mortals (read "customers") of the world. We may even see the new paradigm many are predicting.

The Outlook

I want to take some time in this month's Mobiltorial to thank each of you, our readers, and our consulting clients for making this a truly great year for The Outlook. Our subscriber base has grown substantially, our consulting practice is at an all-time high, and our Wireless Data Universities and presentations are better attended than ever before.

At our Wireless Dinner during Comdex, we were fortunate to be able to announce a new relationship with Forbes and Forbes ASAP. This relationship has resulted in a new conference and there will be other announcements either prior to, or right after the first of the year. We are pleased to be working with Forbes. The folks at Forbes have vision and understand that the areas we are covering are important to their audience as well as to ours. Along with our growth during 1999, this new relationship is exciting and challenging to all of us here at The Outlook.

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The Summit 4Mobility

Our first conference as a result of the new Forbes relationship is our Summit 4Mobility (4Mobility.net). This conference will be held February 13 through 15, 2000, at the Arizona Biltmore. It is a CEO-level,

by invitation-only conference, and we are inviting people from the telecommunications, computing, and information industries to attend. By the time you read this, the first invitations will have been sent. If you feel that you or your CEO should receive an invitation, please contact me immediately (aseybold@outlook.com).

The agenda that we have planned and the speakers who have already confirmed or have been invited will make the Summit 4Mobility a very special event. We hope that those from the various industries taking part in the sessions, hallway conversations, and social gatherings, will leave the event primed and ready to take full advantage of the world of wireless, the Internet, and computing, because these worlds are colliding at a remarkably fast pace. When planning an event such as this, you try to determine what keeps CEOs awake at night and address those issues. For this Summit, we are also trying to identify the issues that would be keeping these CEOs awake at night if they knew about them.

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The Wireless Dinner

The Ninth Annual Wireless Dinner at Comdex was a hit, and all who attended had a good time. The facilities at the Top of the Riveria were *almost* sufficient to handle the 250 of us who crowded in. We have already reserved twice the space—the entire Top of The Riveria—for our Tenth Annual Wireless Dinner.

However, I did make one mistake. American Mobile ARDIS was prepared to raffle one of its eLink two-way email devices and I did not call on them to do so. I feel badly about this, especially since the eLink is a great device and one of our dinner guests would have been very pleased to have won it. I hope that the folks at American Mobile will forgive me and give us another chance next year.

Psion gave each attendee a new Revo handheld computer, Panasonic gave us each a mobile CD player, and The Outlook gave expandable briefcases to haul away the goodies. BellSouth Wireless Data gave away a group of RIM 950 Interactive pagers to people who knew how many countries have Mobitex networks (the answer is 26), and JP Systems raffled several prizes including some Palm Vs with the Novatel modem and OmniSky's service, and several SkyTel two-way pagers.

The complete list of sponsors includes American Mobile, BellSouth Wireless Data, Ericsson, Hewlett-Packard, IBM Mobile and Wireless Services, JP Systems, Microsoft, Motorola Wireless Data Group, Panasonic, Psion, Research In Motion, Starfish Software, and SyberSay.

Awards

At the 1998 dinner, Randy Granovetter from Microsoft stated that Microsoft would be presenting awards at the 1999 dinner for networks with more than 100,000 paying data users on their systems. True to her word, Microsoft awarded three trophies of a beautiful engraved glass: one to American Mobile ARDIS for its RD-LAP network, one to BellSouth Wireless Data for its Mobitex network, and one to Send-it for having more than 100,000 customers in Europe. Randy then raised the bar for next year. The Microsoft network

Tom Wheeler, the President of the CTIA, gave a short speech in which he shared some of his thoughts with us.

awards at the Tenth Annual Wireless Dinner will be given to those that have 500,000 paid data users! My guess is that with all that is happening in 2000, there will be at least six networks that will meet this goal.

Speakers

Each of our sponsors is given an opportunity to say a few words, and I always have a few comments to make. This year, Tom Wheeler, the President of the CTIA, gave a short speech in which he shared some of his thoughts with us. Tom urged us (the wireless industry) to move forward with what is available today and not wait for what is "just down the road" in the terms of capabilities, speeds, and feeds. We need to work with customers today to provide services *now*. As always, Tom's remarks were right on the money.

Next Year

Next year will mark the tenth year of our Wireless Dinner at Comdex. With the entire Top of The Riveria, we will have more elbowroom and we are working on a smoother way to integrate speakers with the cocktail party and dinner. However, whatever else we do, everyone agrees that the most important and enjoyable part of the evening is the "schmoozing."

Ending the Year

Whether you consider January 1, 2000 to be the first day of the new millennium or the first day of the last year of this millennium, you have to agree that 2000 is going to be one exciting year for mobility and wireless. We will begin seeing Bluetooth devices, we will find out whether WAP is as big a deal as WAP Forum members believe it is, and the Sprint/ WorldCom and Vodafone/Bell Atlantic deals will be finalized and the companies will be offering voice and data over a large part of the U.S.

New devices, handsets, personal digital assistants, Palm-size PCs, handheld computers, notebooks, and mobile gadgets that we might not yet know about will be introduced. I also expect to see several "wireless portals" that are more than simply a place where mobile workers with "mobile browsers" go to access content, and I expect to see some of the really smart start-ups come online with products and services that will make the big boys sit up and take notice.

The year 2000 will *not* be the "year of wireless data," but it *will* be a great year for the wireless data industry.

Happy Holidays!

I would like to take this opportunity to wish each of you the best for the holidays and for the new year. This year has been a great year for mobility and wireless, and for us here at The Outlook. I believe that 2000 will be an even greater year for the industry.

However you celebrate the holidays, my hope is that you will pause for a moment or two and reflect on the year just past, contemplate the year ahead, and promise yourself that you will take a few moments along the way next year to enjoy what is being built here. If we spend every bit of our time building the industry, it won't mean as much— and it certainly won't be as much fun—as it will if we pause once in a while to reflect on what we have accomplished and savor the moment.

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November/December Picks And Pans

👍👍 *Before you read on, we must ask that you forgive us for the following shameless self-promotions, but we have been having such a great time we want to share the good times with you.*

👍 *Ninth Annual Wireless Dinner at Comdex*

A record crowd, thirteen sponsors, and a great time was had by all. Next year will be the Tenth Annual Wireless Dinner and we have reserved the entire Top of The Riveria (double the space). The Tenth will be even more special with more sponsors and guests. If you want to get in on the fun, let us know as soon as possible. We started out with five guests and closed this year's event at 250 people. Next year will be even bigger and better (but not too big!).

👍 *Forbes, Forbes ASAP, Wireless Week, Andrew Seybold's Outlook*

What do these companies have in common? As announced at the Wireless Dinner, the companies mentioned above will host the first Summit 4Mobility (4mobility.net) February 13-15 in Phoenix. This is a CEO-level, by invitation event. Invitations are out to CEOs in the telecommunications, computing, information, and software industries. Speaker invitations are also out. Many of the speakers have already signed on, and sponsorships are going fast. We are pleased that Forbes and Wireless Week think enough of this first Summit 4Mobility to join us in this endeavor.

👍 *Psion Revo*

Wireless Dinner guests received one of these new handheld computing devices. The Revo has a great design, and Psion loaded the units with an address book of the dinner attendees. Psion also programmed in several alarm reminders to visit its booth at Comdex. We understand that some of the units woke folks up in the morning!

👍 *www.Stylusplus.com*

We have seen combination stylus/pen/pencils before, but we really like the 4-way pen we recently received from Stylusplus. You can choose ink colors (black, blue, red, orange or pink highlighter) as well as the color of the stylus tip (orange, yellow, grey), or a pencil. The pen holds four refills at a time and has a smooth action—all for only $19.99.

👎 *NeoPoint's Syncronization Software*

The NeoPoint 1000 is a feature-rich feature phone that connects to a desktop computer and synchronizes with the calendar, phone book, and to-do list. It is a phone that should appeal to the early adopters among us—early adopters who, if they are using Microsoft Outlook have upgraded it to Outlook 2000, the only version of Outlook that the NeoPoint software does not support.

👎 *Bluetooth Developers Conference*

First, most of the developers are convinced that the most important function for Bluetooth is in wireless data. My take is that Bluetooth will also create renewed efforts in voice command and control. If I can talk into a wireless earpiece, I certainly don't want to have to take my phone off my belt to dial a number.

Second, most of the demonstrations sort of worked or didn't work at all. If it ain't easy to use, it ain't goin to get used!

Third, there was talk of developing products based on optional higher-power specifications. In a smart move, the HomeRF/SWAP group wants to work on a HomeRF/Bluetooth combination. Consumers could install a single PC card into a notebook computer and use either technology . It will be a shame if the high-power Bluetooth folks derail this effort.

👎 *Sprint PCS Captures The Wireless Web*

Sprint took over the moniker "PCS" when it began building out its network, so other PCS network providers decided not to use "PCS" in their names or in the names of their networks. Now Sprint PCS has usurped "The Wireless Web." At the recent CDMA congress, every speaker chose to refer to "The Wireless Internet"—except for the Sprint PCS folks who talked up The Wireless Web. I guess if you want PCS Wireless Web services, you will have to open a Sprint PCS account!

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